Education

KwaZulu-Natal Department of Education
REPUBLIC OF SOUTH AFRICA

LIFE SCIENCES

COMMON TEST

MARCH 2017

NATIONAL SENIOR CERTIFICATE

GRADE 10

MARKS: 60

TIME: 1 hour

N.B. This question paper consists of 8 pages.

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INSTRUCTIONS AND INFORMATION

Read the following instructions carefully before answering the questions.

1. Answer ALL the questions.
2. Write ALL the answers in the ANSWER BOOK.
3. Start the answers to EACH question at the top of a NEW page.
4. Number the answers correctly according to the numbering system used in this question paper.
5. Present your answers according to the instructions of each question.
6. Make ALL drawings in pencil and label them in blue or black ink.
7. Draw diagrams, tables or flow charts only when asked to do so.
8. The diagrams in this question paper are NOT necessarily drawn to scale.
9. Do NOT use graph paper.
10. You must use a non-programmable calculator, protractor and a compass, where necessary.
11. Write neatly and legibly.

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SECTION A

QUESTION 1

1.1 Various options are provided as possible answers to the following questions. Choose the correct answer and write only the letter (A to D) next to the question number (1.1.1 to 1.1.5) in your ANSWER BOOK, for example 1.1.6 D.

1.1.1 The layer surrounding the vacuole is known as the ...

A cell membrane.
B tonoplast.
C nuclear membrane.
D cell wall.

1.1.2 Study the functions listed below:

(i) Forms a protective layer in a plant cell
(ii) Site for glucose synthesis
(iii) Gives shape to a cell
(iv) Site for protein synthesis

Which ONE of the following describes the function of the ribosome?

A (i) only
B (i) and (ii) only
C (ii) and (iv) only
D (iv) only

1.1.3 In which phase of mitosis does the nucleolus and nuclear membrane start to disappear?

A Telophase
B Anaphase
C Prophase
D Metaphase

1.1.4 The element required for the formation of haemoglobin is ...

A calcium.
B iodine.
C iron.
D phosphorous.

1.1.5 One of the symptoms of the disease scurvy is ...

A abnormal bone formation.
B skin eczema.
C night blindness.
D bleeding gums.

(10)

TOTAL SECTION A: 10

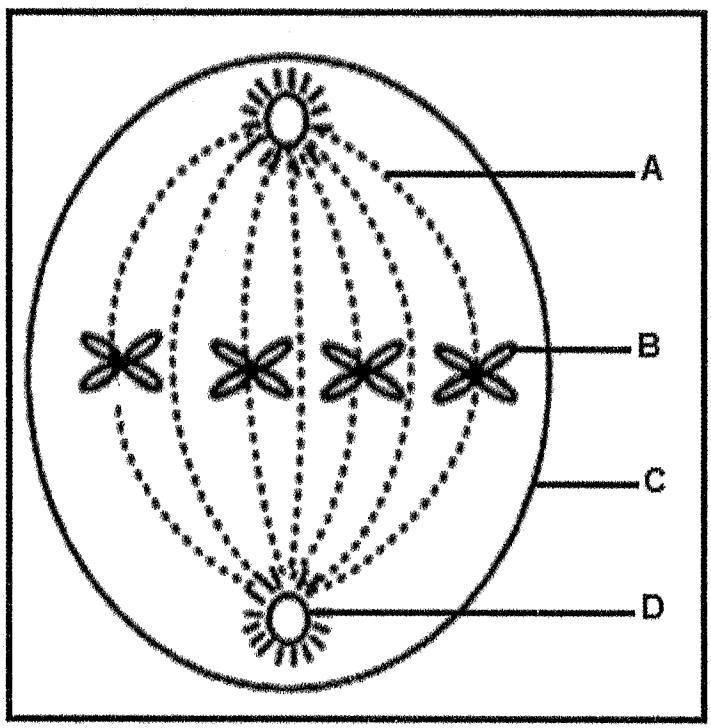
GR 10 LIFE SCIENCES

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SECTION B

QUESTION 2

2.1 Study the diagram below showing a phase of mitosis.



2.1.1 State the phase of mitosis represented in the diagram above. (1)

2.1.2 Give the LETTER and the NAME of the part that allows you to identify the above diagram as representing an animal cell. (2)

2.1.3 Identify parts **B** and **C**. (2)

2.1.4 How many chromosomes will be present in each cell at the end of mitosis? (1)

2.1.5 What do you think will happen during cell division if part **A** is damaged? (1)

2.1.6 Explain the importance of interphase. (2)

(9)

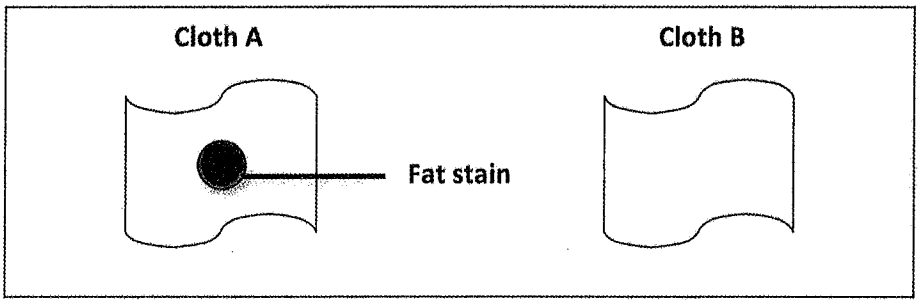
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2.2 An investigation was carried out to determine the effect of a detergent containing fat-digesting enzymes on a fat stain.

The procedure was as follows:

- Two identical cloths were used.
- Cloths **A** and **B** had identical fat stains.
- Cloth **A** was washed using a detergent not containing fat-digesting enzymes for five minutes at 37^0C.
- Cloth **B** was washed using a detergent containing fat-digesting enzymes for five minutes at 37^0C.

The diagram below shows the results of the investigation.



2.2.1 State a conclusion for this investigation. (2)

2.2.2 State TWO factors that were kept constant during this investigation. (2)

2.2.3 What was the purpose of cloth **A** in the investigation? (1)

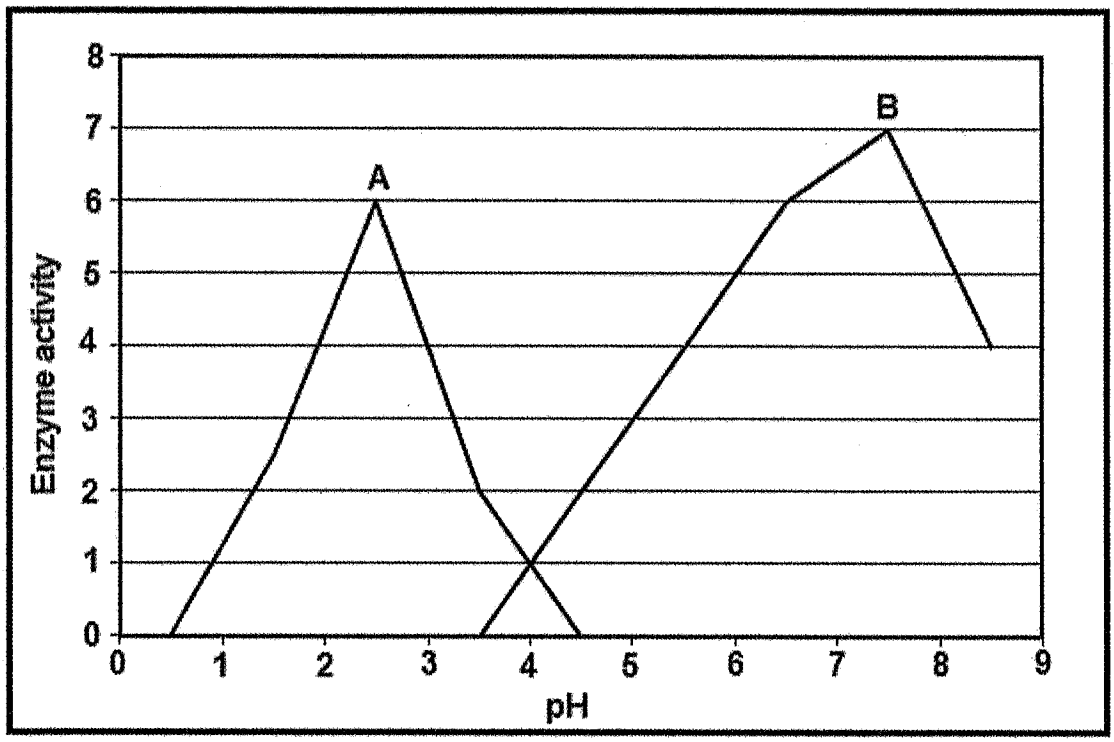
2.2.4 State what should have happened to the enzymes if cloth **B** was washed in boiling water. (1)

(6)

[15]

QUESTION 3

3.1 The graph below shows the activity of enzymes **A** and **B**.



3.1.1 Which property of enzymes is shown in the graph? (1)

3.1.2 State one pH value at which the activity of enzymes **A** and **B** is the same. (1)

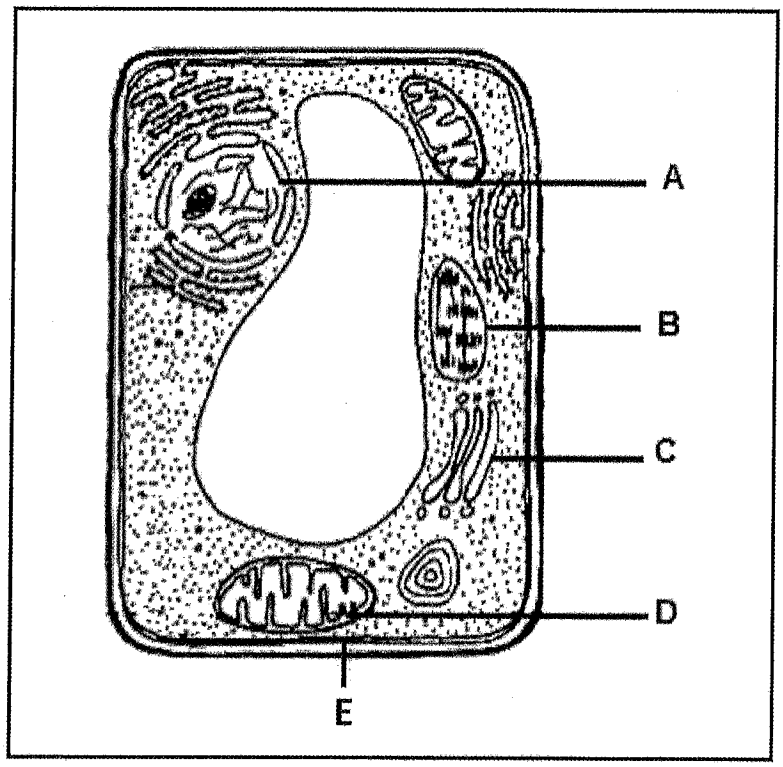
3.1.3 What is the best pH for the activity of enzyme **A**? (1)

3.1.4 Explain why enzymes **A** and **B** cannot function in the same part of the human digestive system. (2)

(5)

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3.2 Study the diagram below showing organelles found in a cell.



3.2.1 Write down the LETTER only of the part that:

(a) Contains chlorophyll (1)

(b) Has a secretory function (1)

3.2.2 State TWO organic compounds that make up part **E**. (2)

3.2.3 State TWO visible reasons why this diagram represents a plant cell. (2)

3.2.4 Explain ONE consequence if the organelle **D** is damaged. (2)

3.2.5 List TWO functions of organelle **A**. (2)

(10)

[15]

TOTAL SECTION B: (30)

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SECTION C

QUESTION 4

Various organic compounds play a role in the structure and functioning of cells. To aid in this functioning, many substances may enter or leave these cells in different ways. When growth and repair is required, these cells divide to form new cells. When these cells divide abnormally, a cancer may result.

Provide a description for each of the following:

1. The method used to test for the presence of starch in an unknown sample (5)

2. Methods by which substances move through a membrane (8)

3. Causes and treatment of cancer (4)

Content: (17)
Synthesis: (3)

(20)

NOTE: NO marks will be awarded for answers in the form of flowcharts or diagrams.

TOTAL SECTION C: 20

GRAND TOTAL: 60

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Incl Grades 10 & 11

Education

KwaZulu-Natal Department of Education
REPUBLIC OF SOUTH AFRICA

LIFE SCIENCES

MEMORANDUM

COMMON TEST

MARCH 2017

NATIONAL SENIOR CERTIFICATE

GRADE 10

N.B. This memorandum consists of 4 pages.

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SECTION A

QUESTION 1

1.1

1.1.1 B✓✓
1.1.2 D✓✓
1.1.3 C✓✓
1.1.4 C✓✓
1.1.5 D✓✓

(5 x 2) **(10)**

TOTAL SECTION A 10

SECTION B

QUESTION 2

2.1

2.1.1 Metaphase✓ (1)

2.1.2 D✓ Centriole✓
OR
C✓ Cell membrane✓ (2)

2.1.3 B Chromatid✓
C Cell membrane✓/plasma membrane (2)

2.1.4 4✓ (1)

2.1.5 Chromatids will fail to move towards opposite poles✓ (1)

2.1.6 - DNA replication occurs✓
- to double the genetic material✓
- to that each cell after mitosis has identical genetic material✓ ANY (2)

(9)

2.2

2.2.1 The detergent containing enzymes removed the fat stain✓✓ (2)

2.2.2 - Identical cloths✓
- Identical fat stains✓
- Same time✓/5 minutes
- Same temperature✓ ANY (2)

2.2.3 Act as control✓/Verify results/compare results (1)

2.2.4 Denatured✓/changed shape (1)

(6)

[15]

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QUESTION 3

3.1

3.1.1 Enzymes are sensitive to pH changes✓ (1)

3.1.2 4✓ (1)

3.1.3 Accept any answer between 2.4 and 2.6✓ (1)

3.1.4 - Enzyme **A** functions best at low pH✓/acidic medium
- Enzyme **B** functions best at neutral pH✓ (2)

(5)

3.2

3.2.1 (a) **B**✓ (1)

(b) **C**✓ (1)

3.2.2 - Protein✓
- Lipids✓ (2)

3.2.3 - Has cell wall✓
- Has large vacuole✓
- Has chloroplast✓ ANY (2)

3.2.4 - No cellular respiration✓
- No energy produced✓
- No life functions✓/activities ANY (2)

3.2.5 - Control cell activities✓
- Carrying of hereditary characteristics from parents to their off-spring✓
- Control protein synthesis✓ ANY (2)

(10)

(15)

SECTION C

QUESTION 4

Starch test
- Add a few drops of iodine solution✓to the unknown sample
- If the sample turns blue-black✓
- then it contains starch✓
- If the sample remains brown✓
- then starch is absent✓ (5)

Movement of substances through a membrane

- ***Diffusion**✓
- Liquid and gas molecules✓
- move from higher to lower concentration✓
- ***Osmosis**✓
- Water molecules✓
- move from dilute solution to a concentrated solution✓
- through a differentially permeable membrane✓
- ***Active transport✓/absorption**
- Substances move against a concentration gradient✓
- using energy✓

***3 compulsory marks** + any 5 other points (8)

Causes of cancer
- Substances in cigarette ✓
- Radiation from the sun ✓/X-ray radiations
- Mutations ✓
- Viruses ✓
- Certain diet and lifestyle ✓ Any (2)

Treatment of cancer
- Surgery is done✓
- Radiotherapy✓ using radiation
- Chemotherapy✓ using various chemicals Any (2) (4)

Content **(17)**
Synthesis **(3)**
[20]

ASSESSING THE PRESENTATION OF THE ESSAY

RELEVANCE	LOGICAL SEQUENCE	COMPREHENSIVE
All information provided is relevant to the topic	Ideas arranged in a logical/ cause-effect sequence	Answered all aspects required by the essay in sufficient detail
All information is relevant to testing starch, movement of substances, causes and treatment of cancer	Correct sequence of events in testing starch, movement of substances, causes and treatment of cancer	At least (3) points on starch test (5) points movement of substances; (3) points on causes/treatment of cancer.
1 mark	1 mark	1 mark

TOTAL SECTION C: 20
GRAND TOTAL: 60